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FROM:Dinsmore & Shohl Dayton

9374496405

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Dinsmore & Shohl LLP
ATTORNEYS

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from **PATRICIA L. PRIOR**

Direct: 937-449-6449 / Fax: 937-223-0724 / patricia.prior@dinslaw.com

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Application of

Applicants : William F. Lauersdorf et al.
Serial No. : 10/643,048
Filed : August 18, 2003
Title : METHOD OF MAKING A COMPOSITE WITH A
BARRIER LAYER
IN A CLOSED MOLD PROCESS AND COMPOSITE
PRODUCED THEREBY
Docket : FIB 0093 I2/14309
Examiner : Barbara J. Musser
Art Unit : 1733
Confirm. No. : 3112

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Patricia L. Prior

Patricia L. Prior

Reg. No. 33,758

Sir:

BRIEF ON APPEAL

This is the Brief on Appeal in the appeal from the Office Action mailed
November 17, 2005, finally rejecting claims 1-19. A Notice of Appeal was timely mailed
on February 16, 2006. Our credit card form in the amount of \$500.00, which is the
indicated fee for a Brief on Appeal for a Large Entity under 37 C.F.R. §41.20 (b)(2), is
enclosed.

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Real Party in Interest

The real party in interest is the assignee of this patent application, Illinois Tool Works Inc., by assignment from the named inventors.

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Related Appeals and Interferences

Applicants know of no other appeals or interferences involving related cases which would have any effect or bearing on this appeal.

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Status of Claims

Claims 1-19 remain in this application. Claims 20-22 were canceled. Claims 1-19 stand rejected. Accordingly, claims 1-19 are before this Board on appeal. A correct copy of the claims appears as an Appendix to this Brief.

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Status of Amendments

The claims were not amended after final rejection.

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Summary of the Claimed Subject Matter

The present invention relates to a closed mold method of making a composite having a barrier layer. The method includes providing a mold; applying and curing a layer of gel coat on an inside surface of the mold; applying and curing a layer of barrier composition over the cured gel coat, the barrier composition comprising: about 10 to about 50 wt% vinyl ester resin; about 15 to about 60 wt% polyester resin; 0 to about 30 wt% monomer; about 1 to about 15 wt% thickening agent; about 0.1 to about 5 wt% accelerators; about 1 to about 25 wt% filler; and a catalyst; applying a layer of fiberglass reinforcement over the cured barrier composition; applying resin to the fiberglass reinforcement; closing the mold; curing the resin; and opening the mold and removing the composite, wherein the composite has an improved surface finish compared to a composite made with a closed mold process without the barrier composition. Various closed mold processes can be used, including, but not limited to, compression molding, vacuum bag molding, vacuum infusion molding, and resin transfer molding. P. 1, line 24 to p. 2, line 13; p. 3, lines 14-25; and p. 5, lines 10-21.

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Grounds of Rejection

The grounds of rejection presented for review on appeal are:

1) claims 1-5, 9-11, 13-15, and 17-19 were rejected under 35 U.S.C. §103(a) as being unpatentable over Campanella (U.S. Patent No. 5,900,311) in view of Skogman (U.S. Patent No. 5,522,340) and Parish (U.S. Patent No. 5,843,221);

2) claims 6-8 were rejected under 35 U.S.C. §103(a) as being unpatentable over Campanella (U.S. Patent No. 5,900,311) in view of Skogman (U.S. Patent No. 5,522,340) and Parish (U.S. Patent No. 5,843,221), and further in view of Haraldsson (U.S. Patent No. 6,558,608);

3) claim 12 was rejected under 35 U.S.C. §103(a) as being unpatentable over Campanella (U.S. Patent No. 5,900,311) in view of Skogman (U.S. Patent No. 5,522,340) and Parish (U.S. Patent No. 5,843,221), and further in view of Kia (U.S. Publication 2004/0038059); and

4) claim 16 was rejected under 35 U.S.C. §103(a) as being unpatentable over Campanella (U.S. Patent No. 5,900,311) in view of Skogman (U.S. Patent No. 5,522,340) and Comstock (U.S. Patent No. 4,288,571).

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Argument

1. Campanella, Skogman, and Parish Do Not Render Claims 1-5, 9-11, 13-15, and 17-19 Unpatentable

Campanella teaches a vacuum-assisted method of making a polyester composite. The method includes coating the surface of a mold with a gel coat, applying a skin laminate over the partially cured gel coat, applying a fiber reinforcement to the skin laminate, closing the mold, and injecting a one phase matrix precursor while the mold is under vacuum. The one phase composite matrix precursor comprises a polyester, a reactive monomer, and a low-profile additive. Abstract, col. 6, lines 5-13, and claim 1. The skin laminate contains a thermosetting resin, such as vinyl ester, vinyl ester modified epoxy, and vinyl ester modified unsaturated polyester, with a high fiber content, about 25 to about 45% fiber, typically chopped fiber or a continuous strand fiber mat. Col. 3, lines 24-30, col. 5, lines 38-47, and col. 6, lines 14-16.

Skogman describes a vessel with side walls having a first inner wall spaced apart from a second outer wall. The first inner wall and second outer wall are composed of resinous material. There is an intermediate single woven member disposed and bonded between the first inner and second outer walls. See Abstract, and col. 2, lines 15-20. The process of making the composite is described at col. 5, lines 19-58. A gel coat is applied to the mold and cured. A fiberglass reinforced resin skin coat is sprayed onto the cured gel coat, and allowed to cure. After the fiberglass reinforced resin skin coat is cured, an external structural reinforcement layer is made by applying rolls of fiberglass which are wet with liquid polyester resin. After this layer is cured, a bed coat of fiberglass resin is sprayed on the external structural reinforcement layer. While this layer is still wet, the intermediate single woven member is laid onto it and rolled into the bed coat with a handheld roller until it is embedded in the bed coat. The embedded intermediate single woven member is wetted with a liquid resin. A thin fiberglass reinforced resin cap layer is sprayed up on the wet intermediate single woven member and rolled out with a handheld roller and allowed to cure. An internal structural reinforcement layer is made by applying rolls of fiberglass which are wet with resin, and the layer is then cured.

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Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. MPEP 2143.01. Skogman cannot properly be combined with Campanella because there is no motivation to combine the references.

First, Campanella teaches that the skin laminate is not cured before the fiber reinforcement is applied; therefore, there is no reason to look to Skogman for when the skin laminate is cured. The examiner stated that "Campanella teaches that layers can be cured prior to closing of the mold *such as the gel coat.*" [Emphasis added.] However, Campanella makes it clear that the only layer which is cured before the fiber reinforcement is applied is the gel coat, and that layer is only partially cured.

The polyester composite is formed by coating the surface of a mold with a gel coat; *applying a skin laminate over the partially cured gel coat*; applying a fiber reinforcement to the skin laminate; closing the mold; and injecting the 1-phase matrix precursor while the mold is under vacuum.

Abstract.

First, a gel coat is usually applied to the surface of the mold, at least partially cured, and *then a skin laminate is applied over the at least partially cured gel coat.* These are open mold operations. Then *the fiber reinforcement is applied to the skin laminate*, the mold is closed, and the matrix precursor injected under vacuum. *The precursor is then allowed to cure*, with or without a heat supplement, and the part or article is demolded.

Col. 6, lines 6-13.

Claim 1 recites:

A vacuum-assisted transfer molding process for preparing a molded article comprising a fiber-reinforced thermosetting polyester composite, the composite comprising reinforcing fiber in excess of 30 wt %, based upon the weight of the composite, in a thermoset polyester matrix, wherein the process comprises:

- (a) coating the surface of a mold with a gel coat;
- (b) *allowing the gel coat of step (a) to at least partially cure*;

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- (c) *applying a skin laminate over the at least partially cured gel coat of step (b);*
- (d) *applying fiber reinforcement to the skin laminate of step (c);*
- (e) *closing the mold; and*
- (f) *while the mold is under vacuum, injecting a one-phase matrix precursor comprising, in weight percent based upon the weight of the matrix precursor, from about 20 to about 60% of an unsaturated polyester resin with a molecular weight/double bond factor between about 150 and about 190; 30 to about 70% of a reactive monomer; 1 to about 25% of a thermoplastic polymer which is miscible in a blend of the polyester resin and the reactive monomer; and an initiating amount of a free radical initiator.*

Campanella specifically describes the gel coat as being partially cured before the application of the skin laminate, and the curing of the precursor after the mold is closed. If the skin coat was cured before the fiber reinforcement was applied, that curing step would have been discussed as well. Thus, Campanella teaches that the skin coat is not cured before the skin laminate is applied. Therefore, there is no need to look for when curing takes place in Skogman's open mold process.

Furthermore, the two references cannot be combined because they use very different processes. Skogman uses an open mold process, while Campanella teaches a process in which there are closed mold steps.

The examiner stated that "Skogman is used to show that the skin laminate (barrier coat) is typically cured prior to application of the fiber reinforcement. This curing is unrelated to whether the mold is an open mold or a closed mold." Contrary to the examiner's position, when curing of the skin laminate occurs is related to what process is used. Skogman is only relevant to when curing of the skin laminate is done in an open mold process because Skogman only teaches open mold processes. Skogman is not relevant to when curing of a skin laminate layer would occur in a closed mold process, as in Campanella.

The examiner attempts to justify the combination by arguing that Campanella and Skogman are related references. "Both Campanella . . . and Skogman . . . are not only directed to fiber reinforced thermosetting resin composites which are formed using a gel coat and barrier material, but also are directed to making a skin for a boat hull. While

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one is open mold and the other is closed mold, the two form very similar products using similar layers, i.e., gel coat, skin laminate (Barrier composition), fiber reinforcement, etc." However, the differences in the two processes are significant and cannot be ignored.

Finally, the examiner states that "Examiner is not combining the open mold process of Skogman with the closed mold process of Campanella but rather using Skogman to determine when a layer of material in the same type of process as Campanella is conventionally cured." While the examiner argues that she is not combining the open mold process of Skogman with the closed mold process of Campanella, that is exactly what is being done. The significant differences between the two processes make it improper to look at an open mold process to determine when a layer in a closed mold process would be cured.

In addition, Campanella teaches away from the use of open mold processes, specifically criticizing them as being unable to provide composites with the strength of his process.

The hallmark of these composites is their combination of physical strength as measured by one or more standard strength tests for composites and smooth surface profile *as compared to the thermosetting polyester composites made from a typical hand lay-up or spray up process. . . .*

Abstract.

The hallmark of these composites is their combination of the physical strength (as measured by one or more standard strength tests for composites) and smooth surface profile *(as compared to the thermosetting polyester composites made from a typical hand lay-up or spray-up process. . .)*

Col. 1, lines 12-15.

The hand lay-up and spray-up processes are the most common practices in the manufacture of large and complex parts, such as boat hulls and truck body panels. Continuous or chopped fiber mats are impregnated with and engulfed in a matrix resin, and the resin is cured without additional heat or pressure. The typical fiber reinforcement (e.g., glass fiber) content of a composite made by these techniques is about 20 to 40% by weight, based on the cured weight of the composite.

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Therefore, the physical strength (as measured by any one of a number of different tests) of these composites is typically not very great and if greater physical strength is desired for a particular application, then a thicker composite is usually required (the physical strength of a composite being a function of the fiber content of the composite and its thickness.) Moreover, the surface appearance of the finished part made with these methods may vary from part to part depending on various factors, e.g., processing conditions, the nature of the thermosetting resin, and the like.

Col. 2, lines 9-27.

The physical strength of the composites of this invention is much greater than the physical strength of similar composites made from conventional hand lay-up, spray-up, or resin transfer molding techniques. . . .

Col. 3, lines 14-20.

Thus, Campanella teaches away from using open mold processes. Therefore, Campanella cannot be combined with Skogman, which teaches an open mold process.

With respect to the combination of Parish with Campanella and Skogman, the examiner stated that the "references do not disclose the specific composition used to make the skin laminate" and cited Parish's composition for this.

However, Campanella and/or Skogman cannot properly be combined with Parish because there is no motivation to do so. (Campanella cannot be combined with Skogman for the reasons discussed above.)

The examiner stated that "[i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to use the composition of Parish in combination with the continuous strand fiber mat of Campanella and Skogman as the skin laminate of Campanella et al. since the composition uses a minimum of volatile solvents and can enhance the surface appearance of composites (Col. 3, ll. 20-42) which is desired by Campanella et al. which discloses that the purpose of skin laminates is to improve the surface smoothness of the product (Col. 5, ll. 32-33) and to use this in combination with the strand fiber mat disclosed in Campanella since it might be difficult to evenly apply a composition containing the high fiber content desired by Campanella. (Col. 5, ll. 43-47)"

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Parish describes a sprayable, high solids, low-volatiles filler composition which is used as a coating on a variety of substrates. The coating is applied to a substrate in a thickness up to 6 mils. The filler composition provides a surface which is immediately suitable for subsequent application of top coats. The filler composition includes a filler/glazing component, a catalyst component, and a second organic solvent component. The filler/glazing component contains vinyl ester or vinyl ester in combination with polyester resin, filler, thixotropic clay, accelerator, and a first organic solvent.

Parish's very high solids, low volatiles sprayable filler composition is applied to the surface of a variety of substrates, such as molded parts, and provides improved surface quality for the surface of the molded part. Parish's composition does not contain fiberglass reinforcement.

Campanella teaches high fiber content composites, in excess of 30 wt% and preferably in excess of 40 wt% fiber. Abstract, and col. 3, lines 3-12. Campanella's skin laminate contains 25 to 45% by weight of fiber, with the fiber being in the form of 0.5 to 2 inch chopped fiber or a sheet of continuous strand fiber mat. The thermosetting resins typically used include vinyl esters, vinyl ester modified epoxies, and vinyl ester modified unsaturated polyesters resins. Col. 3, lines 26-30, and col. 5, lines 38-47. Skogman includes a fiberglass reinforced resin skin coat. Col. 5, line 30-33. The fiber reinforcement in the skin laminate helps to provide strength to the molded part.

The composition of Parish, which does not contain any fiberglass reinforcement, cannot be combined in the skin laminate of Campanella and/or Skogman, which do contain fiber, because the presence of the fiberglass reinforcement would defeat the surface enhancing characteristic of Parish. If the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. MPEP 2143.01.

The examiner suggests as part of the motivation to use Parish's composition with the strand fiber mat disclosed in Campanella that "it might be difficult to evenly apply a composition containing the high fiber content desired by Campanella." However, Campanella does not teach or suggest that there is any problem evenly applying its skin laminate. Nor has the examiner provided any other reference teaching or suggesting this.

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In response, the examiner states that "examiner is not suggesting that Campanella discloses it is difficult to apply a high fiber content but rather that it is desirable to apply a high fiber content. However, since the reference teaches the fiber can be a premade mat or fibers, the reference clearly realizes that one may be more desirable than the other. One in the art would appreciate that either type of fiber layer in Campanella could be used and that the mat may be more desirable since particulate/fiber concentrations are known in general to clog sprayers." Even assuming this is true, it still does not provide any motivation to combine a material which contains no fiberglass reinforcement and which is used as a surface coating on a molded part to improve the surface appearance with a skin laminate which requires the presence of fiber for strength.

The examiner further states that "[s]ince the composition of Parish is the same as that of applicant, it would have the same effect, namely causing the composite to have an improved surface finish." However, this ignores the fact that in the examiner's combination of Parish and Campanella (which is improper as discussed above), the skin composite would have fiberglass reinforcement in it, a combination which would not provide the same good surface characteristics as Parish alone.

The examiner also stated that "[s]ince the claim does not require the skin laminate to be fully cured, the partially cured skin laminate of Campanella is considered to read on the claims." The examiner indicated in the Advisory Action that this was "intended to refer to the partially cured gel coat rather than to suggest that Campanella teaches a partially cured skin laminate. The grounds for rejection have not been materially altered." However, the partially cured gel coat of Campanella does not read on the claims, which require "applying and curing a layer of gel coat on an inside surface of the mold; [and] applying and curing a layer of barrier composition over the cured gel coat."

Even if Campanella and Parish are properly combinable, the combination does not render the claimed invention obvious. Campanella cannot be combined with Skogman for the reasons discussed above. Campanella does not teach or suggest "applying a layer of fiberglass reinforcement over the cured barrier composition," as claimed. Campanella does not teach or suggest curing the skin laminate before the fiber reinforcement is applied. See col. 6, lines 5-13.

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The examiner stated "[r]egarding applicant's argument that Campanella does not disclose curing the skin laminate prior to applying the fiber reinforcement, Skogman shows that this appears to be conventional in the same type of arts as Campanella." However, as discussed above, Skogman cannot be combined with Campanella because they describe different types of processes (open v. closed mold), and because Campanella teaches away from using open mold processes.

Thus, claims 1-5, 9-11, 13-15, and 17-19 would not have been obvious to one of ordinary skill in the art at the time the invention was made over Campanella in view of Skogman and Parish.

2. Campanella, Skogman, Parish, and Haraldsson Do Not Render Claims 6-8 Unpatentable

Haraldsson is cited as teaching a vacuum-assisted resin transfer molding process. However, Haraldsson does not remedy the deficiencies of Campanella, Skogman, and Parish. Therefore, claims 6-8 would not have been obvious to one of ordinary skill in the art at the time the invention was made over Campanella in view of Skogman and Parish and further in view of Haraldsson.

3. Campanella, Skogman, Parish, and Kia Do Not Render Claim 12 Unpatentable

Kia is cited as teaching the use of hollow glass microspheres as a filler in a barrier layer of a composite. However, Kia uses an open mold process (Abstract, and paragraph [0064]), which cannot be combined with the closed mold process of Campanella for the reasons discussed above.

Furthermore, Kia does not remedy the deficiencies of Campanella, Skogman, and Parish.

Thus, claim 12 would not have been obvious to one of ordinary skill in the art at the time the invention was made over Campanella in view of Skogman and Parish and further in view of Kia.

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4. Campanella, Skogman, and Comstock Do Not Render Claim 16 Unpatentable

Campanella cannot be combined with Skogman for the reasons discussed above.

Furthermore, Comstock cannot be combined with Campanella and/or Skogman because there is no motivation to do so.

Comstock discloses a composition which includes an unsaturated polyester, a low profile additive, monomer, peroxide accelerator, fillers and thickening agent. Col. 1, lines 57-64, col. 5, lines 24-35, and col. 6, lines 38-43. The low profile additive is a vinyl ester resin, and it is included to reduce shrinkage. Col. 1, lines 25-48. The composition is molded under pressure. Col. 8, lines 34-42.

The examiner stated that "[i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to use the composition of Comstock et al. as the skin laminate of Campanella et al. and Skogman since Campanella et al. discloses that conventionally skin laminates contain vinyl ester/unsaturated polyester mixes with high amounts of fibers, and since it can have excellent surface properties and smoothness (Col. 1, ll. 20-21) which is desired by Campanella et al. which discloses that the purpose of the skin laminates is to improve the surface smoothness of the product. (Col. 5, ll. 32-33)[.]"

Contrary to the examiner's position, it would not have been obvious to use Comstock's composition as a skin laminate in Campanella's process. Comstock's composition is the material which is to be molded into the final parts, such as automobile fenders, dashboards and the like. See col. 1, lines 10-24, and lines 49-56, and col. 6, lines 65-68. There is no teaching or suggestion in any of the references that Comstock's composition could be used as a layer in another composite. Comstock's composition might be substituted for Campanella's composite, but there is no teaching or suggestion anywhere that it could be used as the skin laminate layer in a molded part.

In addition, even if Comstock's composition could be used as Campanella's skin laminate, it would not render the claimed invention obvious. The claimed process recites "applying a layer of fiberglass reinforcement over the cured barrier composition." However, in Campanella's process, the application and partial curing of the gel coat layer and the application of the skin laminate are open mold processes. See col. 6, lines 5-13. If Comstock's composition was applied over the gel coat layer, it would not be cured

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before the layer of fiberglass reinforcement was applied because Comstock's composition requires pressure to cure it.

The examiner stated "[r]egarding applicant's argument that Comstock's composition require [sic] pressure to cure it since it is a sheet molding compound, the reference des not disclose it is only a sheet molding composition, but rather that it can be used as one. Since the composition contains the same general range of materials as applicant's, it is considered to be usable in the same type of processes as applicant's, namely an open mold process. . . . Applicant has not shown that this type of compound cannot be cured in an open mold. The composition does not appear to have any characteristics which would preclude it being cured in an open mold. The only indication of the material being under pressure during curing is an example, and an example does not indicate the entirety of the invention as envisioned by applicant."

Contrary to the examiner's position, Comstock teaches that its compound is cured using pressure.

The *actual molding cycle* will, of course, depend on the exact compositions being molded. *Suitable molding cycles* are conducted at temperatures on the order of about 250°F. to about 350°F. for periods of time ranging from about 0.5 minute to 5 minutes.

Col. 6, line 68 to col. 7, line 5.

The "premix" composition prepared was then used to mold panels, 14 inches by 18 inches by 1/8 of an inch, in a matched metal mold under the *following mold cycle*:

Pressure	500 psig
Temperature	330 °F.
Time of Molding	
Cycle	2-3 minutes

Col. 8, lines 33-42.

In addition, Comstock identifies its material as usable as a sheet molding compound. Col. 6, lines 38-43. Comstock includes low profile additives, which are used in sheet molding compounds to reduce shrinkage of the composition. Col. 1, lines 25-40, col. 4, lines 23-57, col. 5, lines 11-23, Example 1, Table 1, and claim 1. Sheet molding

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compounds are known to require pressure for curing. See e.g., Gynn, U.S. Patent No. 5,521,232, col. 4, line 50 to col. 5, line 58.

The examiner has not identified any teaching or suggestion in Comstock that its material can be cured without pressure. Everything which Comstock actually teaches indicates that pressure is required to cure the material: the identification of the material as usable as a sheet molding compound, the use of low profile additives, and the example showing molding under pressure.

Thus, Comstock specifically teaches that pressure is required to cure its material. Therefore, the examiner's proposed combination of using Comstock's composition as the skin laminate in Campanella's process would not meet the claim limitation "applying a layer of fiberglass reinforcement over the cured barrier composition." Comstock's material would not be cured because the mold is open at that point in Campanella's process.

Therefore, claim 16 would not have been obvious to one of ordinary skill in the art at the time the invention was made over Campanella and Skogman in view of Comstock.

Conclusion

For all of the above reasons, applicants submit that claims 1-19 are not anticipated by, or obvious in view of, the cited prior art. Applicants respectfully request that this Board reverse the rejection of the Examiner.

Respectfully submitted,
DINSMORE & SHOHL LLP

By Patricia L. Prior
Patricia L. Prior
Registration No. 33,758

One Dayton Centre
One South Main Street, Suite 1300
Dayton, Ohio 45402-2023
Telephone: (937) 449-6400
Facsimile: (937) 449-6405

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CLAIMS APPENDIX

1. (Previously Presented) A closed mold method of making a composite having a barrier layer, the method comprising:

providing a mold;

applying and curing a layer of gel coat on an inside surface of the mold;

applying and curing a layer of barrier composition over the cured gel coat, the barrier composition comprising:

about 10 to about 50 wt% vinyl ester resin;

about 15 to about 60 wt% polyester resin;

0 to about 30 wt% monomer;

about 1 to about 15 wt% thickening agent;

about 0.1 to about 5 wt% accelerators;

about 1 to about 25 wt% filler; and

a catalyst;

applying a layer of fiberglass reinforcement over the cured barrier composition;

applying resin to the fiberglass reinforcement;

closing the mold;

curing the resin; and

opening the mold and removing the composite,

wherein the composite has an improved surface finish compared to a composite made with a closed mold process without the barrier composition.

2. (Original) The method of claim 1 wherein the mold is a two piece mold, and wherein the mold is closed by moving the two pieces together.

3. (Original) The method of claim 2 further comprising applying pressure to the mold.

4. (Original) The method of claim 2 wherein the resin is applied after the mold is closed, and wherein the resin is applied under pressure.

5. (Original) The method of claim 4 wherein a vacuum is applied after the mold is closed.

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6. (Original) The method of claim 1 wherein the mold is closed by sealing a vacuum bag around the mold.

7. (Original) The method of claim 6 further comprising applying a vacuum to the vacuum bag.

8. (Original) The method of claim 7 wherein the resin is applied after the vacuum is applied.

9. (Original) The method of claim 1 wherein the closed mold method is a closed mold process selected from compression molding, vacuum bag molding, vacuum infusion molding, or resin transfer molding.

10. (Original) The method of claim 1 wherein the accelerators comprise at least one material selected from dimethyl para-toluidine, dimethyl aniline, diethyl aniline, dimethyl acetacetamide, cobalt octoate, potassium octoate, copper naphthanate, quaternary ammonium salts, or mixtures thereof.

11. (Original) The method of claim 1 wherein the fillers comprise a material selected from hollow spheres or microspheres, wollastonite fibers, mica, potassium aluminum silicate, calcium silicate, calcium sulfate, aluminum trihydrate, or combinations thereof.

12. (Original) The method of claim 11 wherein the hollow spheres or microspheres comprise a material selected from silicate glass, ceramic, plastic, or combinations thereof.

13. (Original) The method of claim 1 wherein said thickening agent is a thixotropic clay.

14. (Original) The method of claim 1 further including fumed silica.

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15. (Original) The method of claim 1, wherein the catalyst is selected from methyl ethyl ketone peroxide, benzoyl peroxide, or cumyl hydroperoxide.

16. (Original) The method of claim 1, wherein the barrier composition comprises:

- about 10 to about 20 wt% vinyl ester resin;
- about 40 to about 60 wt% polyester resin;
- about 5 to about 10 wt% monomer;
- about 1 to about 15 wt% thickening agent;
- 0 to about 2 wt% fumed silica;
- about 0.1 to about 5 wt% accelerators; and
- about 1 to about 25 wt% fillers.

17. (Original) The method of claim 1, wherein the barrier composition comprises:

- about 20 to about 50 wt% vinyl ester resin;
- about 15 to about 40 wt% polyester resin;
- about 5 to about 10 wt% monomer;
- about 1 to about 15 wt% thickening agent;
- 0 to about 2 wt% fumed silica;
- about 0.1 to about 5 wt% accelerators; and
- about 1 to about 25 wt% fillers.

18. (Original) The method of claim 1, further comprising applying a second layer of fiberglass reinforcement, applying resin to the second layer of fiberglass reinforcement, and curing the resin.

19. (Original) The method of claim 1, further comprising applying and curing a second layer of barrier composition.

20-22. (Canceled)

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EVIDENCE APPENDIX

None.

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RELATED PROCEEDINGS APPENDIX

None.

PTO/SB/17 (12-04)

Approved for use through 07/31/2006. OMB 0651-0032

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Effective on 12/08/2004.
Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).**FEE TRANSMITTAL
For FY 2005**☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$) 500.00

Complete if Known

Application Number	10/643,048
Filing Date	April 17, 2006
First Named Inventor	William F. Lauersdorf
Examiner Name	Barbara J. Musser
Art Unit	1733
Attorney Docket No.	FIB 0093 12/14309

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FEE CALCULATION**1. BASIC FILING, SEARCH, AND EXAMINATION FEES**

Application Type	FILING FEES		SEARCH FEES		EXAMINATION FEES		Fees Paid (\$)
	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	Fee (\$)	Small Entity Fee (\$)	
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

2. EXCESS CLAIM FEES

Fee Description	Fee (\$)	Small Entity Fee (\$)
Each claim over 20 or, for Reissues, each claim over 20 and more than in the original patent	50	25
Each independent claim over 3 or, for Reissues, each independent claim more than in the original patent	200	100
Multiple dependent claims	360	180

Total Claims	Extra Claims	Fee (\$)	Fee Paid (\$)	Multiple Dependent Claims	Fee (\$)	Fee Paid (\$)
- 20 or HP =	x	=				
HP = highest number of total claims paid for, if greater than 20						
Indep. Claims	Extra Claims	Fee (\$)	Fee Paid (\$)			
- 3 or HP =	x	=				
HP = highest number of independent claims paid for, if greater than 3						

3. APPLICATION SIZE FEE

If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

Total Sheets	Extra Sheets	Number of each additional 50 or fraction thereof	Fee (\$)	Fee Paid (\$)
- 100 =	/ 50 =	(round up to a whole number) x	=	

4. OTHER FEE(S)

Non-English Specification, \$130 fee (no small entity discount)

Other: Brief on Appeal

Fees Paid (\$)

500.00

SUBMITTED BY		Registration No. 33,758	Telephone (937) 449-6400
Signature	Patricia L. Prior	(Attorney/Agent)	
Name (Print/Type)	Patricia L. Prior	Date	April 17, 2006

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